YIJUN LIU

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EDUCATION

Ph.D., Electrical and Computer Engineering (GPA: 3.6/4.0) — Aug. 2018 - Dec. 2024 (Expected)
Minor: Math
University of Southern California — *Los Angeles, CA*
Research: Neuroimaging, brain network analysis, graph-based modeling, machine learning
Anneberg graduate fellowship

M.Eng., Electrical and Computer Engineering (GPA: 4.0/4.3) — Aug. 2016 - Jan. 2018
Cornell University — *Ithaca, New York*
ECE project festival best poster award in bio-signal track

B. Eng., Communication Engineering (GPA: 3.7/4.0) — Aug. 2012 - Jun. 2016
Soochow University — *Suzhou, Jiangsu, China*
National scholarship of China (3/290)

EXPERIENCE

Teaching assistant, EE538 Computing Principles for Electrical Engineers — May 2022 - Aug. 2023
University of Southern California — *Los Angeles, CA*

- A course about introduction to C++, data structures & algorithms
- Built an autograder pipeline with github action enabling instantaneous feedback for coding assignments
- Hosted discussion sessions & office hours

Data Scientist — Mar. 2018 - Jul. 2018
Grubhub, Inc. — *New York City, NY*

- Developed, evaluated and analyzed menu-item recommendation system
- Tools: Python, Apache Spark

Software Development Intern — May 2017 - Aug. 2017
Grubhub, Inc. — *New York City, NY*

- Built an image search pipeline consisted of object detection, indexing, query, and evaluation
- Achieved precision@5 with 0.64, precision@15 with 0.77 on Food-11 dataset
- Tools: Python, OpenCV, Keras, Google Vision

Engineering Intern — Oct. 2015 - Mar. 2016
Bosch Automotive Products — *Suzhou, Jiangsu, China*

- Implemented project selection, resource information filling features for a budget controlling system
- Managed data in the system's database using SQL Server
- Tools: Java, JavaScript, CSS, HTML, SQL

SELECTED PROJECTS

Whole brain parcellation based on graph node embedding

- Adapted deepwalk-based graph embedding approach to brain area division with functional MR images
- Achieved top results compared to SOTA methods in homogeneity & alignment with other modalities
- Under preparation for journal paper submission

Outlier slice detection of brain MR images based on unsupervised learning

- Developed a robust PCA-based outlier detection pipeline to identify images with signal dropout due to motion
- Beat SOTA under various settings in terms of AUC-ROC and average precision

- Under preparation for journal paper submission

Movie feature prediction from human brain responses [code] [poster]

- Proposed a framework to map human responses to movie features based on 3-way tensor decomposition
- Obtained higher correlations with ground truth soundtrack loudness & frame brightness than ICA approach
- Tools: Python, MATLAB

Convolutional Neural Network for Pancreas Segmentation [code] [poster]

- Implemented and experimented with 2D and 3D CNNs including preprocessing and validation
- Beat SOTA by $> 3\%$ with mean DSC of 86.7% on NIH pancreas segmentation dataset
- Tools: Python, Tensorflow, Keras

PUBLICATIONS

Conference proceedings & presentations

- **Liu, Y.**, Li, J., Wisnowski, J., & Leahy, R. (2023). Cortical parcellation with graph representation learning on resting-state fMRI. In Workshop on Data Mining in Bioinformatics, SIGKDD Conference on Knowledge Discovery and Data Mining (BioKDD).

- **Liu, Y.**, Li, J., Wisnowski, J., & Leahy, R. (2022). Functional parcellation of the cerebral cortex based on brain network identification using resting-state fMRI. In Neuroscience.

- **Liu, Y.**, Li, J., Wisnowski, J., Joshi, A., & Leahy, R. (2021). Brain network decomposition for naturalistic stimulus paradigm. In Organization for Human Brain Mapping (OHBM).

- Varadarajan D., Bhushan C. , Gonzalez-Zacarias C., Choi S. , **Liu, Y.**, Joshi A. , Shattuck D. , Haldar J. , Leahy R.. (2020). Brainsuite diffusion pipeline (BDP): Processing tools for diffusion-MRI. In Organization for Human Brain Mapping (OHBM).

- **Liu, Y.**, & Liu, S. (2018). U-Net for pancreas segmentation in abdominal CT scans. In International Symposium on Biomedical Imaging (ISBI).

- **Liu, Y.**, Liu, X., Yang, X., & Xie, D. (2015). Log-periodic antenna with interdigital structure for energy harvesting from TV broadcast tower. In Asia-Pacific Microwave Conference (APMC)

Journal

- Li, J., **Liu, Y.**, Wisnowski, J., & Leahy, R. (2023). Identification of overlapping and interacting networks reveals intrinsic spatiotemporal organization of the human brain. Neuroimage.

- Joshi, A., Choi, S., **Liu, Y.**, Chong, M., Sonkar, G., Gonzalez-Martinez, J., ... & Leahy, R. (2022). A hybrid high-resolution anatomical MRI atlas with sub-parcellation of cortical gyri using resting fMRI. Journal of Neuroscience Methods.

ACADEMIC SERVICE

- Reviewer for Organization for Human Brain Mapping (OHBM), 2023
- Reviewer for Conference on Knowledge Discovery and Data Mining (SIGKDD), 2023
- Reviewer for NeurIPS-AI4Science workshop, 2023

COMPETITIONS

- Top 8% of 1875 teams, Prediction of Wild Blueberry Yield, Kaggle, 2023
- Second place in Health Hackathon, Columbia University, 2018